Applying a Critical and Humanizing Framework of Instructional Technologies to Educational Practice

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Abstract

Traditionally in the field of instructional design and instructional technology, educators and researchers have focused on technical tools, rather than the socio-cultural implications of technology integration. Thus, integration of technology into educational practice is often made without evaluation of the belief systems informing those choices, and without adequate contemplation of the unique needs of the human users using these systems. Analysis of the ideological perspectives that impact our educational technology, including technological determinism, social determinism, technological utopianism and technological dystopianism is the starting point of this examination of our relationship with technology. The humanizing framework subsequently outlined draws directly from this discussion of ideology by calling on educators to critique their own beliefs about technology. It serves as the starting point for reflection on the impact of human interaction in educational technology practice. The humanizing framework emphasizes strategies and techniques that promote the integration and development of critical thinking skills, the fostering of student engagement and interaction, and the development of community.

> "Consciously or not, deliberately or inadvertently, societies choose structures for technologies that influence how people are going to work, communicate, travel, consume…over a very long time" (Winner, 1980)

Today in education, our technological tools shape and structure the interaction, collaboration, and communication between and among all stakeholders in the educational process: students, educators, instructional designers, and administrators. In our educational policy and practice, we often reduce the term "technologies" to our technological devices because they are "clear and accessible cases of the pattern...of modern technology" (Borgmann, 1984). Often, we fail to reflect on the larger picture of technology practice, beyond just seeing and discussing the devices to the technical (skills, knowledge, devices). We often interchangeably use "technology" to mean "computer," forgetting that some of our most effective "technologies" in education are processes that are deeply intertwined with organizational and cultural factors.

While the field of instructional technology traditionally has focused on the technical skills and organizational aspects of technology integration, there is a burgeoning recognition of the importance of cultural relevance and congruence (Pacey, 2000). This is addressed by researchers beginning to link the agendas of instructional technology and multicultural education (Damarin, 1998). For this to happen effectively, however, researchers forging those links need to address the underlying ideologies that fuel research agendas and designs, as well as the design of learning experiences. For example, in some of the literature, multicultural educators, enamored with technological utopianism, see technology as a way to level social inequities (Marshall & McCarthy, 2002). (For one example of this phenomenon, see literature on the "digital divide" Attewell, 2001; Cullen, 2003). While there are certainly positive effects of implementing new technologies, these must be balanced against the reported adverse effects. To put the discussion of causes and values of technological change into a larger frame, the first section of this paper will address commonly encountered ideological orientations toward technologies.

In addition, with much of the focus of educational technology aimed at our technological devices, and less delving into the organizational and cultural implications of new technological tools, it is easy to lose sight of the humans who will be impacted by their use. Yet the cultural aspect of our implementation of educational technologies has the most impact on the individual experience of engaging in learning via new technological inventions and media. For example, as we integrate computerized or computer-mediated learning spaces into education; such as, discussion boards and online chats, we are shaping an experience of a specific way of being and interacting in the world. The communication is inherently different from a face-to-face interaction (Spagnolli, Varotto, & Mantovani, 2003; Watts, Nugroho, & Lea, 2003), and there are not well-developed role models or prior experience for use of communication of this type in educational contexts. As educators struggling to orient our students to "being" humans while using new communications technologies, we have a responsibility to critically consider a humanizing framework as we implement new media and technologies to the learning process. Therefore, after the examination of ideologies, we present characteristics of a

humanizing framework of instructional technology integration to suggest guidelines for consideration by all educators adding technology to their instructional practice.

Ideologies of Technology

Before approaching technology integration in instruction, it is imperative to examine one's own assumptions and beliefs about technologies and their impact on human users. Because ideologies are all-encompassing in our thoughts and interactions with others, they are hard to detect and especially hard to question (Smart, 1958), as we have to step outside of this particular frame of thought that we are in every day to examine how our way of thinking influences our actions unconsciously. This examination can also be useful in analyzing the language used in policy and in research to better understand our motivations in technology integration in education.

Our view on what technologies are and what role they play in education is a prominent example of ideology, although we simultaneously deal with a multitude of conflicting ideologies. For example, technologies are utilized in schools and seen as driver of change in society either by contributing to social change/justice, increasing cognitive skills, or developing skills that are necessary at the workplace. At the same time, there is a near equal amount of literature that deals with the broken or unfulfilled promises of technology (See, for example, the 'digital divide' debate and its various facets: Norris, 2001; Servon, 2002).

In the following sections, we will examine the following ideologies: technological determinism/social determinism, symptomatic ideology towards technology, and technological dystopianism/utopianism.

Technological Determinism/Social Determinism

Technological determinism involves seeing technology as being the fundamental force of social change, and technological development and progress as moving according to its own internal logic (See Mody, 2004; Smith & Marx, 1994 for applications in the field of nanoscience). From a viewpoint of technological determinism, humans have little agency in a world run by technologies. The statement that the computer is changing "world society at all levels" by Christopher Evans (Evans 1979 cited in Robins & Webster, 1989), with the computer identified as the entity with agency effecting change, serves as a prominent example. Commonly-heard expressions like "technology is coming your way" and the ubiquitous, "it's going to fix whatever problems you're having" might be utterances encountered by people working with technologies on a daily basis, which assume a separation of the technical from the social, and a well-defined account of technology's effects (Grint & Woolgar, 1997; Ovortrup, 1984). In education, technological determinism can manifest as the idea that students and educators have to "keep up" with the technologies or be "left behind," as if the technologies are driving changes and decisions in the instructional process.

One can classify technological determinism into two forms, hard and soft (for the distinction, see (McGinn, 1991). In its extreme, proponents of hard technological determinism would argue that technologies are dominant, irreversible, and *cause* social change, where the soft form only claims that technology is one influence among others, and not an absolute determinant of social change.

Social determinism is a converse perspective to technological determinism, whereby technology is an incidental part of social change. If technology is in the focus at all, then what matters is not the technologies themselves, but the social, political, cultural and/or economic systems in which those technologies are embedded (See MacKenzie & Wajcman, 1985 for a seminal publication.). Where technological determinism identifies autonomy as an attribute of technological innovation, and society has "to catch up" with the next technological innovation; in social determinism, society and individual players within are seen as autonomous and thus humans drive the development of technology to serve the need and goals of society.

Technological Utopianism/Dystopianism

Where technological and social determinism are attempts to answer the question of what causes change, technological utopianism/dystopianism are attempts to value the resulting effect of the change, regardless of its cause.

Technological utopianism embraces the promise of technology (see Segal, 1985 for an overview) and portrays computing technologies as "enabling" a utopian vision of society. Some authors 'enchant' or 'proselytize' us with images of new computer technologies that offer never-before-experienced possibilities of manipulating large amounts of information with little effort -- to create insights, to search for information, and to facilitate collaboration and social engagement between people. Utopianists sketch a future emphasizing the egalitarian and democratic power of technologies (like equal access to information), coupled with the positive effect of technologies on efficiency and productivity, resulting in a liberating effect whereby people can become more creative. This philosophy embraces a vision of the technological revolution creating a new civilization in which old problems are overcome. In part, it is a temptation wrought from the complexity of engineering social change through human processes (Weinberg, 2003), and ostensibly much easier to simply envision a technological fix.

It should sound very familiar once one starts to evaluate the advertising world and the purported premise for much technology adoption. Essentially, our technological devices are often touted as liberating us from the grime and sweat of labor (e.g., washing machine, dishwasher, gasoline-powered lawnmower) and provide a life of leisure (e.g., television). Borgmann (1984), in his chapter "The Promise of Technology," cites three advertisements from the early 1980s promising technological fixes: an electronic gadget that translates foreign languages, gourmet food at home "without waiting or cooking" and a jogging computer that will result in "greater endurance" and less tiredness (1984). Here, the onus of education, food, and health are placed on the technological devices, rather than on the human effort, talent, or ability.

Technological dystopianism is the philosophical counterpoint to utopianism. In a dystopian view, technologies have gained control of human existence and changed conditions for the worse. In other words, this is a vision of a technology-created hell. For example, Postman's work *Technopoly* proposes a vision of a society where all features of culture: religion, art, privacy, truth, etc. are overrun and redefined by technology (1993). A dystopianist would argue that any form of technology adoption, such as the recent proliferation of computing, will amplify existing societal flaws, creating a society where people will lose their freedom to businesses and government agencies or become dependent on complex technologies that they don't comprehend. According to this way of thinking, technologies have precipitated and will continue to cause a greater division between the rich and poor (Powell, 2002; Schement, 2002). More people will be out of work, and human beings will be reduced to robotic devices, unable to function without their computers. Remedies to acute problems created by these technologies will introduce new chronic problems, and human alienation will flourish as people will interact with technologies more than with other human beings.

Conclusion for Ideologies

Any form of determinism is reductionist. A reductionist theory reduces some class of phenomena to some simpler phenomena of another class (Gellner, 1974). In the case of technological and social determinism, complex intertwined relationships between technology and society are either reduced to exclusively societal or technological forces. It is too simplistic to simply say that there no positive or negative effects of technology. To indicate that either technology or society are exclusively and independently causal drivers for change or to possess the expectation of solely positive or negative effects as a result of technology are assumptions that need to be critically examined and answered depending on the respective context.

Similarly, utopianism and dystopianism are extreme positions at the opposite side of a spectrum that contains many more moderate positions. Both dimensions (technological/social determinism and dystopianism/utopianism) can be contrasted with a holistic or systemic view (For example, see v. Bertalanffy, 1968), in which the whole cannot be explained by a linear causality model or by analyzing only identifiable single components of the system. In this paper, we can only address these issues rudimentarily. (For a broader overview of this discussion, see TechTrends "Special Issue on Systemic Change," 2006 ,Volume 1, edited by Charles Reigeluth).

A Humanizing Framework

Rationale for a Humanizing Framework

The combination of technological determinism and technological utopianism are largely the most prevalent of the ideologies and fuel our rationale for spending billions of dollars to equip schools with computers in schools despite mixed reviews that such expenditure results in increased learning proportional to dollars expended (Clark, 1983; Ross & Lowther, 2003; Schacter, 1999; Wenglinsky, 1998). As educators, we squander precious

resources if we wholly buy into either deterministic or utopian rationales for integrating new technologies into education. Instead, we need to be leaders in asking the questions of how these innovations will impact the learning experience, and we need to evaluate the allocation of resources to ensure that technology integration occurs for beneficial and culturally appropriate purposes. At the same time, we cannot pretend that technologies are inconsequential or unworthy of larger discussion because they are so intertwined with the social and cultural realities of individuals (Mesthene, 2003). Thus without critique, analysis, and recognition of the ways the design and implementation of how new technology will inevitably shape the individual learning experience, educators risk falling prey to the fallacies of determinism and utopianism at the expense of the humans participating in the educational process.

Though individual empowerment has not necessarily always been the historical goal of education, for many educators the notion of impacting individual lives is a strong motivator for working in the field education. If we buy into the notion that technical mastery of new technologies equals empowerment, we have fallen prey to a reductionist thinking that will not benefit our students. Our society's rapid adoption of new technologies has had complex implications, particularly on individual's perceptions of their agency to effect change in their own life and in their community.

In order to bolster students' self-efficacy requires an examination of ideological position on the part of educators and students. The path to human empowerment is closely intertwined with the activity of thinking (Davis, 2003). Thus, the emphasis throughout this framework focuses on the development of critical thinking and independent thinking, including but not limited to," the use of logic, the critical spirit, dialogical reasoning, assessment of criteria, the relationship of content, caring and connections with criticism" (Hemming, 2000).

The following humanizing framework of instructional technology is derived from the literature of philosophy of technology, instructional design, learning theory, multicultural education, and sociology. The wide scope of the inquiry is intended to combine the many disciplines that have called for attention to the humanity in the pursuit of education.

Question Technology

Foremost in a humanizing framework toward technology integration is a grounding of practice in a critical questioning toward our relationship with technology.

This notion of critical questioning comes at a time when critical thinking and higher order thinking skills are at the forefront of the educational agenda. The ISTE NETS*S/T standards call for high school students to be able to: "Analyze advantages and disadvantages of widespread use and reliance on technology in the workplace and in society as a whole" and to "identify" capabilities and limitations of contemporary and emerging technology resources" (*ISTE National Educational Technology Standards (NETS)*, 2004). It is impossible to achieve these standards without an emphasis on questioning, yet at the same time, our ideological beliefs about the positive uses of new

technological tools are so ingrained that often educators and others cannot even see the disadvantages or limitations in order to begin the questioning. Recent research analyzing stories of how teachers integrate technology into their classrooms corroborates that the most neglected parts of the NETS*S standards are those aimed at a critical evaluation of the role of technology on society and on ethics of work with computers like critically evaluating the information found on web sites (Niederhauser, Lindstrom, & Strobel, in press).

Often, humans see the technological tools at our disposal in an instrumental, transactional way, in other words, purely in terms of how they can benefit us, a by-product of life in Habermas' public sphere (1984). It is imperative that educators or designers of learning experiences constantly question and challenge our technology use and take extra steps to ensure that our relationships with the people in our classes move beyond a transactional/instrumental view of students purely as recipients of knowledge. Thus, we can see that just in the questioning of our technology use and how it impacts our interaction and relationships with others, we are brought into the question of how educators relate to and interact with students.

Questioning technology does not mean rescinding our use of technology, but does require a critical reflection on how our technology use affects interpersonal communication. Critical reflection on technology use need not be equated with a "luddite" or “laggard” (as used by Rogers, 1995) attitude towards technologies, but the pejorative connotation of these terms referring to those who choose not to adopt new technologies reveals our cultural bias toward those who voice discomfort with or resist adopting new technologies (Davis, 2003). If we fail to recognize and question the ways in which we let technology shape all aspects our culture--our language, our interactions with others, how we spend our time, etc, we are not only failing to question technology, we are blind to its sway over our lives.

Abandon the Fiction of the “Technological Fix”

Just as Bartolomé (1994) demanded that educators stop looking for a pedagogical fix in the language classroom, educational technologists and administrators need to stop seeking the “technological fix” in the technology-enhanced classroom. Bartolomé’s piece responded to teachers who had asked her for **the** one best method to teach students language. Her response was to propose a “humanizing pedagogy” that commences with incorporating and valuing students’ histories and unique experiences and where the educator uses a variety of methods to reach students across a range of learning styles, including cooperative learning, process writing, reciprocal teaching (Bartolome, 1994). In addition to those pedagogical strategies, we would add approaches that encourage students to think independently [i.e., developing abilities to synthesize, analyze, and evaluate per Bloom’s taxonomy (1984)] including but not limited to: experiential learning, problem-based learning with the use of ill-structured real-world problems, simulation (Chung, Harmon, & Baker, 2001), and collaborative group projects.

From a purely “technical” viewpoint of technology, there is much allure to the idea of a "technological fix," and the preceding discussion of technological utopianism points to why educators seek this miracle cure. This holy grail is what has, in fact, fueled many of the early educational technology studies and instilled distrust in many educators who feared that computers and the like were being developed to replace them in practice (Clare, 2002; Zophy, 1998). Weinberg in his piece, "Can Technology Replace Social Engineering?" argues that "technological fixes" are much easier than trying to engineer mass social change. However, his examples of mass production as a solution to poverty (now there's enough "stuff" for everyone) and the H-bomb as a solution to war (higher stakes for engaging in one) are at best, simplistic. In contrast, Pacey (2000) warns that a technical fix without “social and cultural measures” will be unsuccessful, and Mesthene offers the balanced view that, "technology is continually creating new possibilities for social action as well as new problems that have to be dealt with" (Mesthene, 2003). Therefore, another look at Weinberg’s examples reveals more complexity than he suggests. With the advent of mass production, which at least increased a material standard for living for many people in the world, we now have to deal with overcrowded landfills, increased pollution, and exploited human labor in less "advantaged" parts of the world. Though the H-bomb may, as Weinberg states, stifle war, it has not achieved peace. Without involving the human players in the equation needed to barter peace, the technical “fix” is inherently useless (Pacey, 2000).

From this discussion of much larger social issues, we can understand that any technological shift will create both remedies and additional problems. This applies to the integration of technologies in educational as well. While implementing any new pedagogical strategies combined with new technologies, the instructional aim of the task should be foremost, with the technology used to support the educational objective. There is no one technology that will facilitate easier transfer of knowledge for **all** students, or make difficult concepts clear for **all** students. And unfortunately, though computers can be used to off-load less complex tasks for students, the complex thinking that is required to function as a citizen in today’s world is something that requires scaffolded learning tasks and problem-solving activities—regardless of the technological devices implemented. Instead of seeking one method to reach all students, we need to offer a variety of technology and methods to be used in ways that help students excel. At the same time we need to be cognizant that when we ask students of any age to use new technologies and processes, we are opening a Pandora’s box of both opportunities and potential clashes with existing cultural identities, particularly where technology is being implemented to "bridge" opportunities for the disadvantaged.

Integration of Theory into Practice for Educators and Students

Praxis, the application of theoretical knowledge and critical reflection to practice, is an essential aspect of professional practice because it requires the grounding of one’s practice in a body of external knowledge, existing theory, and highly contextual situations, thus linking one’s knowledge and practice to a human community. A simpler way of describing praxis is as an unending cycle of action, reflection on action and modification of action, corresponding with this reflection. As mentioned in the rationale

for this framework, there is a need for humans to recognize their own agency, and "theorizing in terms of ...praxis...requires a broad view of human agency, emphasizing the integration in practice of agent, world and activity" (Lave & Wenger, 1991). In other words, one has to believe in one's own agency to effect change through action derived through critical reflection, but also through participation in a community of practice.

Beginning with the aforementioned critical reflection on the ideological influence on our technology integration, praxis, or the integration of theory and practice, is an essential tool for those in instructional technology. Educators and instructional designers should engage with theoretical perspectives about the organizational and cultural impact of new technologies on social relationships and resultantly examine the proposed learning outcomes and objectives we develop for education, which often focus on marketable skill orientation instead of the development of more complex and lasting reading, writing, and critical analysis skills. Finally, based on reflective reading, we need to examine the effectiveness of technological solution/approaches in our classes and course design, given the larger picture of what students need from the educational process.

Praxis is not just for educators. Students need to be given opportunities to integrate the skills and knowledge they are learning with authentic contexts, and in turn to be asked to reflect on these experiences. Educators need to be the guide for students in critically reflecting on the texts used in their classes and their experiences. bell hooks writes, “Students have often learned…that college is not the “real” world and that book learning…has no relevance…outside university walls.” (2003). In a time where the development of literacy skills competes with the allure of being passively entertained by television and multimedia, students need to be tasked with identifying the value of the information found in books. Further, these experiences will ideally be linked to authentic ‘real world’ scenarios, interaction with a ‘real world’ audience, or discussion of ‘real world’ events---and all of these can be facilitated by carefully choosing new technologies that will link students to people and ideas and enable them to participate in challenging and rewarding tasks. By encouraging students to make connections between what they read and what they do, and to develop their own reflective praxis, we can empower students to think critically about their actions and agency in the world.

Examine Activity System and its Historicity

In order to contextualize educational technology integration in the social and cultural, we need to examine the activity system surrounding our technology use, and the inherent historicity involved as we engage in technology practice. Important in analysis of the activity system is an understanding of: mediating artifacts, the members of the activity community are, their roles, and rules of the community, as well as proposed goals and actual outcomes. As Engestrom has described in a variety of his work on conceptualizations and application of activity theory, ‘activity systems’ have historicity (1999; 2001), meaning they "take shape and become transformed over lengthy periods of time." (1999, pp. 136-37). The historical aspect is not a uni-dimensional time-line that we all share, but includes several dimensions: (a) the history of the theoretical ideas and tools that shaped the activity (system); (b) the activity system including the students and the

instructors bring their own history, as Freire asserts: “through their continuing praxis, men and women simultaneously create history and become historical beings” (1999); (c) the activities and objects present in the local context have a history; and (d) the interaction between the different layers of historicity, which is not just the histories of individuals in a community or the community or the objects, but also include the tensions and contradictions that naturally occur between these different layers (Engeström, 1999).

Historicity is important because it is helpful to ground educational technology adoption within the context of the larger picture of the previous innovations that have been implemented and analyze what the ensuing impact had been. By embedding our inquiry in a systemic framework and an exploration of past practices, both successful and unsuccessful, we can see how our current implementation of new technologies mirrors previous patterns and use of technologies. Activity theory combined with praxis can provide educators with a helpful approach to examine historical patterns that take into account artifacts, community, roles, and goals, and offers a framework in which educators can take action based on reflection on these patterns and theoretical knowledge to effect change.

Think “Minds On”

As technology has been integrated into education, often on the basis that its status as “fun” will motivate students (Garrison & Bromley, 2004), and multimedia has become more sophisticated and commonplace, learners expect to be “entertained” by their teachers (Conlon, 2000). The idea of integrating multimedia and new technologies for the purposes of entertaining students does a tremendous disservice to both students and educators. Instead, educators should think in terms of student engagement and getting their students into the learning process in a “minds on,” not just a “hands on” manner.

Instead of focusing on entertaining students with new technologies, new technologies should be leveraged to increase student engagement with the content and with fellow learners. The social context for learning (Vygotsky, 1978) is well established as an essential component in learning: “Higher mental functions are, by definition, culturally mediated; they involve not a 'direct' action on the world…in so far as that matter has itself been shaped by prior human practice (e.g., it is an artifact), current action benefits from the mental work that produced the particular form of that matter” (Cole & Wertsch, 1996).To engage learners with the content requires authentic activities, which can be anything from carefully scaffolded (well-structured) case studies (Riedel, Fitzgerald, & Leven, 2003) to ill-structured problem scenarios (Chen & Ge, 2006; D. Jonassen, 2000, , 2004), which necessitates the development of critical thinking skills (Chambers, Angus, & Carter-Wells, 2000; Frederiksen, 1984). These authentic activities should be designed to require learners to engage with each other, such as through structured peer interactions (Ge & Land, 2003). In the literature on student engagement, student “presence” and “interaction” are separate concepts, as the former indicates a sense of belonging in the community and the latter refers to the more active pursuit of engaging in questioning and discussion (Picciano, 2002). Implementing new technologies in education should be done to help students meet the established learning objectives pertinent to the content and to

provide additional strategies for students to feel a "presence" in the classroom community, which in turn will facilitate their comfort in "interacting" with each other to collaboratively and individually make sense of the content.

Build Community

From cognitive learning theory, we understand that all learning is situated and contextual and that learners experience the social dimension of purposeful communities as legitimate peripheral participation (Lave & Wenger, 1991). Learning involves an enculturation process and an apprenticeship into content-specific discourse, which is always embedded in a social context. For this reason, educators should shift way from designing content environments and instead design social spaces, created to scaffold and favorably impact the human interaction in the instruction and create a venue for legitimate peripheral participation.

Building community is a challenge under any circumstances, and becomes even more so when implementing new communication technologies as with each new medium different rules of discourse and interaction. A meta-analysis of research on computer conferencing revealed that groups function differently when online and asynchronous, for example taking longer to reach consensus (Bordia, 1997). Furthermore, group members interacted differently, with less incidence of members caving into social pressure, but also reduced interpersonal understanding (Bordia, 1997). Cultural differences in interpersonal communication can lead to further difficulty when moving to computer-mediated communication, as the impact of the removal of social context cues might vary based on how these contextual cues weigh in face-to-face communication in a particular language (Tu, 2001). By being cognizant of the peripheral participation of learners new to a domain or discourse context, we can understand the need for building community.

The focus of integrating technology in education should also concentrate on bringing people from different perspectives together: "All too often we think of community in terms of being with folks like ourselves: the same class, the same race, same ethnicity, same social standing." (hooks, 2003). An oft-cited "advantage" of new technology is shrinking of the world to a "global community;" however, simply having the means to connect to others globally is useless without the human connections and networking that make those interactions possible. The more computer-mediated communication is used to build these social relationships, the more informed participating parties will have to be about effective communication with this medium, and the more work it will take on the part of all participants to compensate for missing social cues.

Strategies for Building Community

While it is easy to set forth that community needs to be built, building a community requires scaffolding of communication, development of trust, finding and supporting shared goals, examination of shared histories and fostering of respect for the various stakeholders in the community.

To scaffold the communication, rules of discourse should ideally be set forth at the from the first community meeting. Engestrom's activity theory sets forth "rules" as one of the key components guiding interactions between participants in an activity (1999). Rules of discourse should ideally be discussed openly by all members of the community, and supplemented by expectations of the instructor/educator. In the case of a distance education setting, where most, if not all, communication is decontextualized from face-to-face contact, examples and scaffolding of how to communicate in a distance forum, such as rules of "Netiquette" should be discussed openly. As new media have long been shaping our perceptions of appropriate style and usage (See Baron, 2002 for an historical overview of the influence of media over linguistic style), reflection on how e-mail, messaging, blogging, etc. affect the message is an essential part of classroom orientation. Assigning a key facilitator for each assigned communication, ideally a student, to synthesize ideas is helpful in both to facilitating communication but also developing student leadership.

As for building trust, there is no exact recipe, but promoting transparent "rules of discourse" can assist students in reflecting on their manner of communication in ways that are appropriate for the community. A research study of building trust in online learning communities identifies "swift trust" as a phenomenon of decontextualized interaction, and characterized instructor-student communication as an important facet of the development of "swift trust," particularly in what manner and how quickly the instructor introduces and models acceptable communication and conveys social emotional language and enthusiasm in their written statements (Coppola, 2004).

Finally, all participants in a community bring prior experience and "histories" that inform their construction of knowledge in the course content, and guide their interactions with their professor and peers. Ladson-Billing's (1995) analysis of "culturally relevant pedagogy" identifies speech and language practices as imperative in developing a shared understanding, and in her research with classroom teachers identified "reciprocal dialogue" as an essential research tool to ensure that the "teachers' histories and interests determined how much time was spent on various areas." Likewise in a classroom setting, it would seem appropriate also, to develop a dialogue with students to ensure that their histories and interests are represented in the direction of class materials and discussions. This needs to include valuing the experiences that have helped shape each student's beliefs and attitudes that will impact his/her interaction with the rest of the classroom community.

Relinquish Control

Much ado has been made about how the integration of computing technology into classrooms has meant radical change for education. However, research has indicated that it is important to ask how the computers are being used in the classroom (Judge, Puckett, & Cabuk., 2004), and studies that do investigate how computers are being used in the classroom report students in less affluent schools experiencing computers as drill and kill, skills-based exercises, or step-by-step instructions of use (Garrison & Bromley, 2004; Warshauer, 2000; Wenglinsky, 1998). In contrast, learner-centered instruction

necessitates that any use of computers be to achieve an end and "learn while doing" not to learn a software program in and of itself (Soloway et al., 1996). Besides providing a context of potential empowerment of learners, learner-centered instruction requires the learner to make decisions, problem-solve, and construct their own understanding of a given problem or task (McLoughlin & Luca, 2002).

Research indicates that there may be significant cultural barriers within a school to implementing learner-centered instruction regardless of the presence of computing technology. Garrison and Bromley's recent study at one educational site (2004) identified both student and teacher activities that contributed to a culture where teachers were unwilling to give up control. The identified contributing student activities were "pretending," which entailed feigning inability to do tasks the student was capable of and "undermining," which entailed sabotaging technology; for example, kicking the power strip to turn off a computer that was in use. As a result of these student activities, the researchers identified the teachers as engaging in what they termed "defensive teaching," which entailed giving students step by step instructions that minimized potential discipline issues.

Thus, it is not enough to say that teachers need to give up control of the learning process and students need to take control. There are cultural and historical precedents, and encouraging individuals to think outside of traditional roles is challenging. Educators and learners need models of learner-centered instruction that has been successful, and administrative support to be successful. However, where technology is being integrated without consideration of the social and cultural aspects of the teaching process, there is a real danger of failing to engage students and failing to assist them in developing critical thinking skills, without which, they will be at risk to be ruled by the technologies rather than being capable of making informed choices and decisions.

Participatory Design: Using "Learners as Designers"

A helpful strategy in relinquishing instructional control might be implementing a "learners as designers" design strategy. Rooted in a constructivist paradigm and the notion of computers as "mindtools," computers are perceived and utilized as partners for the intellectual and social endeavors of the learners (Jonassen, 2006; Jonassen & Reeves, 1996) This re-defined relationship between learners and computers highlights the notion of "designers as learners" and "learners as designers". As Jonassen et al. (1993) report, instructional designers learned far more by designing CAI (computer-assisted instruction) than the target audience will probably ever learn by learning from the designed CAI. The rich teach-back literature (for example, Johnson & Johnson, 1987) and studies on cohort teacher training (Forsyth & Schaverien, 2004) show learners are especially successful, when designing and teaching for other learners.

Informed additionally by a design and development approach in the software and computer application literature, participatory design can provide us with practice models in integration of technologies in our humanizing framework. As Bettina Törpel (2005) points out, "participatory design of computer applications is about the direct participation

of those who will be affected by the development of a particular computer application in the decision-making, design and/or development process" (p. 177).

There are not many attempts to engage students in the design of technologies for their learning benefit in other domains as the ones directly related to ICT. Students are asked to perform usability testing or asked for input in interface design issues (Tselios, Avouris, Dimitracopoulou, & Daskalaki, 2001), but the functionalities of the technology and the activities that it supports, are prescribed by theoretically based design models, empirical research, or ideas of the instructors or designers. As highly valuable and necessary such input is, input of students as the users of the model is often not sought and therefore not integrated.

Conclusion

Examining one's ideological perspective in relationship to technology is an imperative for all educators, instructional designers, administrators, and learners. Without this introspective analysis of the beliefs informing how the we approach educational technology integration, the core essences of this humanizing framework of educational technology is lost. The importance of developing a humanizing framework of technology integration is in that it empowers each educator to critically evaluate his or her own beliefs about technology and to engage in a critical dialogue with other educators and learners about these beliefs. The core principles of the framework are grounded in educational literature: fostering of independent thinking skills, infusion of authentic and problem-based learning tasks into instruction, implementation of learner-centered instruction, and engagement of students in interaction. From within the perspective of this humanizing framework, the human learners become the focus, and the technological tools can remain subservient to human decisions about their appropriate use for achieving community goals.

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